AMENDMENTS TO THE DRAWINGS

The attached replacement drawings include amendments to Figures 1-3. Figures 1-3 are now modified to designate the legend, "Prior Art". In view of the foregoing, the Examiner's objections to the drawings are believed obviated.

Attachment: Replacement Sheets (FIGS. 1-3)

REMARKS/ARGUMENTS

I. Status of Claims

Claims 1-15 are currently pending in the application. This Amendment amends claims 1, 5, 9, and 13, and addresses each point of objection and rejection raised by the Examiner. The amendments find support in the original specification and drawings. No new matter was added. Favorable reconsideration is respectfully requested.

II. Objections to the Drawings

The Examiner has objected to FIGS. 1-3 and instructed that FIGS. 1-3 be designated by a legend such as --Prior Art-- because only that which is old is illustrated.

Applicants have attached replacement drawings including amendments to Figures 1-3. Figures 1-3 are now modified to designate the legend, "Prior Art". In view of the foregoing, the Examiner's objections to the drawings are believed obviated.

III. Rejection of Claim under 35 U.S.C. §102(b)

Claim 1 has been rejected under 35 U.S.C. §102(b) as being anticipated by Reed et al. ("Reed"), U.S. Patent No. 5,634,206. Applicants respectfully traverse this rejection.

"[A]n invention is anticipated if the same device, including all the claim limitations, is shown in a single prior art reference. Every element of the claimed

invention must be literally present, arranged as in the claim. The identical invention must be shown in as complete detail as is contained in the patent claim." *MPEP § 2131*. Accordingly, Applicants respectfully request reconsideration of the rejection because Reed does not disclose, suggest, or anticipate each and every feature of the amended claim as presented.

In particular, independent claim 1 recites:

> An apparatus for selecting one of an open-loop first transmit antenna diversity scheme and closed-loop second transmit antenna diversity schemes by a user equipment (UE) in a system including a Node B transmitter which includes at least two antennas and uses the first transmit antenna diversity scheme for transmitting space time transmit diversity (STTD)-encoded signals via the antennas and the second transmit antenna diversity scheme for controlling a phase of signals transmitted from the antennas in response to feedback information including relative phase difference information of the antennas from the UE, the apparatus comprising:
>
> a channel estimator for receiving a first channel signal from the Node B transmitter, and estimating a channel response from the received first channel signal;
>
> a determiner for estimating a variation speed of the first channel based on the estimated channel response, and selecting one of the first and second transmit antenna diversity schemes according to the estimated variation speed of the first channel; and
>
> an information generator for generating information indicating the selected transmit antenna diversity scheme.

Applicants respectfully submit that, at the least, Reed fails to disclose, teach, or suggest a "Node B transmitter", a "first transmit antenna diversity scheme for transmitting space time transmit diversity (STTD)-encoded signals via the antennas", and a "second transmit antenna diversity scheme for controlling a phase of signals transmitted from the antennas in response to feedback information including relative phase difference information of the antennas from the UE". Moreover, Reed fails to

anticipate the *selection* and *indication* of one of the first and second transmit antenna diversity schemes.

An exemplary embodiment of the present invention discloses an apparatus and method in which the UE receives a pilot channel signal from the Node B, estimates a channel response from the received pilot channel signal, estimates a variation speed of the channel based on the estimated channel response, selects one of the transmit antenna diversity schemes and transmits information indicating the selected transmit antenna diversity scheme to the Node B, and the Node B transmits channel signals according to the selected transmit antenna diversity scheme.

By contrast, Reed teaches a method and apparatus wherein two or more receiver branches on a selection diversity receiver are compared periodically and the best branch is selected for reception of the transmitted message. As such, the receiver of Reed estimates the signal fading quality and uses the fading estimated quality as the speed of the user.

Moreover, although the selection diversity receiver disclosed in Reed is capable of receiving a transmitted message, Reed makes no reference to the use of a Node B transmitter to transmit channel signals. The entire disclosure of Reed is completely silent on the use of a "Node B transmitter". Accordingly, Reed fails to disclose, teach, or suggest the claimed feature of a "Node B transmitter".

Furthermore, an exemplary embodiment of the present invention discloses "first transmit antenna diversity scheme for transmitting space time transmit diversity (STTD)-encoded signals via the antennas", and a "second transmit antenna diversity scheme for controlling a phase of signals transmitted from the antennas in response to

feedback information including relative phase difference information of the antennas from the UE".

The cited prior art, Reed, merely discloses estimating a signal fading characteristic using a selection diversity receiver wherein receiver branches are compared periodically and the best branch is selected by a diversity selection switch for reception of the transmitted message in each period. This is different from selecting and indicating one of the first and the second transmit diversity schemes as claimed in an embodiment of the present invention. An open-loop diversity scheme, such as the STTD scheme claimed in the present invention, is nowhere to be found in the cited prior art, Reed. Moreover, a closed-loop diversity scheme for controlling a phase of signals transmitted from the antennas in response to feedback information is also nowhere to be found in the cited prior art, Reed. Therefore, Reed can not anticipate the selection or indication of one of these two diversity schemes when Reed is completely silent on both of the transmit antenna diversity schemes claimed in an embodiment of the present invention.

Therefore, Reed fails to anticipate the claimed features of independent claim 1. Dependent claims 2-4 are distinguished from Reed at least for the reasons given above by virtue of their dependence on independent claim 1.

Accordingly, Applicants respectfully request the Examiner reconsider and withdraw the rejection of independent claims 1-4 under 35 U.S.C. § 102(b).

IV. Rejection of Claim under 35 U.S.C. §102(e)

Claim 13 has been rejected under 35 U.S.C. §102(e) as being anticipated by Hottinen et al. ("Hottinen"), U.S. Patent Application Publication No. 2002/0009156. Applicants respectfully traverse this rejection.

Regarding independent claim 13, the claim recites:

> A method for selecting, by a Node B, one of first and second transmit antenna diversity schemes and transmitting a channel signal according to the selected transmit antenna diversity scheme in a system, the method comprising the steps of:
>
> receiving a first channel signal from the User Equipment (UE);
>
> detecting, from the received first channel signal, information indicating one of the first and second transmit antenna diversity schemes, selected by the UE, wherein the first transmit antenna diversity scheme is used for transmitting space time transmit diversity (STTD)-encoded signals via the antennas and the second transmit antenna diversity scheme is used for controlling a phase of signals transmitted from the antennas in response to feedback information including relative phase difference information of the antennas from a user equipment (UE);
>
> determining a transmit antenna diversity scheme to be applied to channel signals to be transmitted by the Node B, based on the detected information; and
>
> encoding the channel signals according to the determined transmit antenna diversity scheme and transmitting the encoded channel signals.

Applicants respectfully submit that, at the least, Hottinen fails to anticipate *selecting* and *detecting* one of first and second transmit antenna diversity schemes and *transmitting* and *encoding* a channel signal *according to the determined transmit antenna diversity scheme*.

An embodiment of the present invention discloses two distinct transmit antenna diversity schemes. The first scheme is an open-loop scheme used for

transmitting STTD-encoded signals. The second scheme is a closed-loop scheme used for controlling a phase of signals transmitted from the antennas. A Node B selects one of these two schemes to be transmitted from the antennas. The selected scheme is then detected, determined, and encoded to channel signals according to the selected/determined transmit antenna diversity scheme.

Hottinen does not disclose, teach, or suggest a first transmit antenna diversity scheme used for transmitting space time transmit diversity (STTD)-encoded signals via the antennas. The diversity scheme taught in Hottinen is a closed-loop system. Hottinen is silent with regards to an open-loop STTD diversity scheme. Moreover, Hottinen is silent regarding the claimed feature of selecting one of the first and second transmit antenna diversity schemes and transmitting a channel signal according to the selected transmit antenna diversity scheme.

Hottinen also fails to mention detecting, determining, and encoding channel signals according to the selected/determined transmit antenna diversity scheme. Hottinen merely discloses a method for transmit diversity or transmit beamforming by means of the resolution of the feedback signaling can be increased without increasing the feedback signaling capacity with no mention of the two diversity schemes presently claimed.

Therefore, Hottinen fails to anticipate the claimed features of independent claim 13. Dependent claims 14-16 are distinguished from Hottinen for at least the reasons given above by virtue of their dependence on independent claim 13. Accordingly, Applicants respectfully request the Examiner reconsider and withdraw the rejections of claims 13-16 under 35 U.S.C. § 102(e).

V. Rejection of Claims under 35 U.S.C. §103(a)

Claims 2-6, 9-12 and 14 have been rejected under 35 U.S.C. §103(a) as being obvious over Reed, in view of Hottinen. Applicants respectfully traverse this rejection.

Regarding independent claims 5 and 9, Applicants respectfully submit that, at the least, Reed fails to disclose, teach, or suggest a "Node B transmitter", a "first transmit antenna diversity scheme for transmitting space time transmit diversity (STTD)-encoded signals via the antennas", and a "second transmit antenna diversity scheme for controlling a phase of signals transmitted from the antennas in response to feedback information including relative phase difference information of the antennas from the UE". Moreover, Reed fails to anticipate the *selecting, determining, and transmitting* of one of the first and second transmit antenna diversity schemes.

An exemplary embodiment of the present invention discloses an apparatus and method in which the UE receives a pilot channel signal from the Node B, estimates a channel response from the received pilot channel signal, estimates a variation speed of the channel based on the estimated channel response, selects one of the transmit antenna diversity schemes and transmits information indicating the selected transmit antenna diversity scheme to the Node B, and the Node B transmits channel signals according to the selected transmit antenna diversity scheme.

By contrast, Reed teaches a method and apparatus wherein two or more receiver branches on a selection diversity receiver are compared periodically and the best branch is selected for reception of the transmitted message. As such, the receiver

of Reed estimates the signal fading quality and uses the fading estimated quality as the speed of the user.

Although the selection diversity receiver disclosed in Reed is capable of receiving a transmitted message, Reed makes no reference to the use of a Node B transmitter to transmit channel signals. The entire disclosure of Reed is completely silent on the use of a "Node B transmitter". Accordingly, Reed fails to disclose, teach, or suggest the claimed feature of a "Node B transmitter".

Moreover, an exemplary embodiment of the present invention discloses "first transmit antenna diversity scheme for transmitting space time transmit diversity (STTD)-encoded signals via the antennas", and a "second transmit antenna diversity scheme for controlling a phase of signals transmitted from the antennas in response to feedback information including relative phase difference information of the antennas from the UE".

The cited prior art, Reed, merely discloses estimating a signal fading characteristic using a selection diversity receiver wherein receiver branches are compared periodically and the best branch is selected by a diversity selection switch for reception of the transmitted message in each period. This is different from *selecting, determining, and transmitting* one of the first and the second transmit diversity schemes as claimed in an embodiment of the present invention. An open-loop diversity scheme, such as the STTD scheme claimed in the present invention, is nowhere to be found in the cited prior art, Reed.

Moreover, a closed-loop diversity scheme for controlling a phase of signals transmitted from the antennas in response to feedback information is also nowhere to

be found in the cited prior art, Reed. Therefore, Reed cannot anticipate the selection or indication of one of these two diversity schemes when Reed is completely silent on both of the transmit antenna diversity schemes claimed in an embodiment of the present invention.

The Examiner admits that Reed fails to disclose a "transmitter for encoding the channel signals according to the determined transmit antenna diversity scheme and transmitting the encoded channel signals". The Examiner attempts to cure this deficiency by combining Hottinen.

However, Applicants submit that Hottinen fails to anticipate *encoding* a channel signal *according to the determined transmit antenna diversity scheme*.

An embodiment of the present invention discloses two distinct transmit antenna diversity schemes. The first scheme is an open-loop scheme used for transmitting STTD-encoded signals. The second scheme is a closed-loop scheme used for controlling a phase of signals transmitted from the antennas. A Node B selects one of these two schemes to be transmitted from the antennas. The selected scheme is then detected, determined, and encoded to channel signals according to the selected/determined transmit antenna diversity scheme.

Hottinen does not disclose, teach, or suggest a first transmit antenna diversity scheme used for transmitting space time transmit diversity (STTD)-encoded signals via the antennas. The diversity scheme taught in Hottinen is a closed-loop system. Hottinen is silent with regards to an open-loop STTD diversity scheme. Therefore, Hottinen is silent regarding the claimed feature of selecting one of the first and second

transmit antenna diversity schemes and transmitting a channel signal according to the selected transmit antenna diversity scheme.

It follows that Hottinen must also be silent regarding *encoding* channel signals according to the selected/determined transmit antenna diversity scheme. Hottinen merely discloses a method for transmit diversity or transmit beamforming by means of the resolution of the feedback signaling can be increased without increasing the feedback signaling capacity without mention of the presently claimed features.

Thus, the combination of Reed and Hottinen fails to teach each limitation of claims 5 and 9, or even suggest each limitation. Nor would there be any apparent reason to combine Reed and Hottinen. Therefore, Applicants respectfully submit that claims 5 and 9 are patentable over the applied art.

Dependent claims 6-8 and 10-12 are distinguished from the cited references for at least the reasons given above by virtue of their dependence on independent claims 5 and 9, respectively. Accordingly, Applicants respectfully request the Examiner reconsider and withdraw the rejections of claims 5-8 and 13-16 under 35 U.S.C. § 103(a).

Claim 7 has been rejected under 35 U.S.C. §103(a) as being obvious over Reed, in view of Hottinen, in further view of Willenegger et al. ("Willenegger"), U.S. Patent Application No. 2003/0174675. Applicants respectfully traverse this rejection. Dependent claim 7 is distinguished from the cited references for at least the reasons given above by virtue of its dependence on independent claim 5. Accordingly, Applicants respectfully request the Examiner reconsider and withdraw the rejection of claim 7 under 35 U.S.C. § 103(a).

Claim 16 has been rejected under 35 U.S.C. §103(a) as being obvious over Hottinen, in view of Willenegger. Applicants respectfully traverse this rejection. Dependent claim 16 is distinguished from the cited references for at least the reasons given above by virtue of its dependence on independent claim 13. Accordingly, Applicants respectfully request the Examiner reconsider and withdraw the rejection of claim 16 under 35 U.S.C. § 103(a).

VI. Allowable Subject Matter

Applicants note that the Examiner has also rejected claim 7 under 35 U.S.C. § 103(a). Applicants have accordingly addressed the rejection and objection of claim 7, and seek clarification on whether claim 7 is rejected or objected to.

Applicants appreciate the indication that claims 7 and 15 would be allowed if rewritten in independent form, but respectfully submit that a broader scope of the invention is patentable in view of the art of record. Applicants request that the rewriting of claims 7 and 15 be held in abeyance until the Examiner has had the opportunity to reconsider the allowability of the parent claims.

VII. Conclusion

In view of the above, it is believed that the above-identified application is in condition for allowance, and notice to that effect is respectfully requested. Should the Examiner have any questions, the Examiner is encouraged to contact the undersigned at the telephone number indicated below.

Respectfully Submitted,

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